



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/010,661	11/30/2001	Chun-Yu Lee	B-4413 619365-7	8711

7590

07/16/2003

Richard P. Berg, Esq.  
c/o LADAS & PARRY  
Suite 2100  
5670 Wilshire Boulevard  
Los Angeles, CA 90036-5679

EXAMINER

CHU, CHRIS C

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 07/16/2003

5

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/010,661

Applicant(s)

LEE ET AL.

Examiner

Chris C. Chu

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 - 22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description:

Reference numbers “5” and “6a” are not disclosed in the specification of instant invention.

In Fig. 2, reference numbers “11a” and “11b” are not disclosed in the specification of instant invention.

In Fig. 5a, reference number “11” is not disclosed in the specification of instant invention.

A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: on page 7, line 6 of the specification refers to a LCD monitor “100” which is not referenced in the figures. A proposed drawing correction or corrected drawings are required in reply to the Office action to

Art Unit: 2815

avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. Applicant is required to submit a proposed drawing correction in reply to this Office action. However, formal correction of the noted defect may be deferred until after the examiner has considered the proposed drawing correction. Failure to timely submit the proposed drawing correction will result in the abandonment of the application.

### ***Specification***

4. The disclosure is objected to because of the following informalities:

On page 8, line 4, "13" should be --15--.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 2815

6. Claims 1 ~ 5, 11, 12, 15 and 17 are rejected under 35 U.S.C. 102(a)/102(b) as being anticipated by the acknowledged prior art of Figs. 1G and 1H.

Regarding claim 1, the acknowledged prior art of Figs. 1G and 1H disclose an LCD monitor, comprising:

- a circuit device (3), forming plural electrodes (at the under 3a) on one side thereof;
- plural bumps (3a), respectively forming on the electrodes;
- a substrate (4), forming plural pads (4a) in accordance with the bumps;
- a means of connection (5), comprising a plurality of conductive particles (1), conducting the bumps and the pads with the conductive particles bonded between;  
and
- a barrier structure (6 and 6a) forming on the side of the circuit device, separating the conductive particles.

Regarding claim 2, the acknowledged prior art of Figs. 1G and 1H disclose the barrier structure being made by an isolating material.

Regarding claim 3, the acknowledged prior art of Figs. 1G and 1H disclose the pads including plural first pads (any group of pads) and second pads (any group of pads). Further, the limitation “wherein the first pads are input terminals of the LCD monitor, and the second pads are output terminals of the LCD monitor” is intended use language which does not differentiate the claimed apparatus over the acknowledged prior art of Figs. 1G and 1H.

Regarding claim 4, the acknowledged prior art of Figs. 1G and 1H disclose the barrier structure (6) being comprised of a first barrier rib (any one of 6) extending along a first direction, whereby forming a partition between the bumps corresponding to the first pads.

Art Unit: 2815

Regarding claim 5, the acknowledged prior art of Figs. 1G and 1H disclose the barrier structure (any one of 6) being further comprised of a second barrier rib extending along the first direction, forming a partition between the bumps corresponding to the second pads.

Regarding claim 11, since the acknowledged prior art of Figs. 1G and 1H does not limit the isolating material to be any particular or specific material, hence his/her disclosure encompasses all well known isolating material including “polyimide (PI)”.

Regarding claim 12, the acknowledged prior art of Figs. 1A ~ 1H disclose the connecting means being an anisotropic conductive film.

Regarding claim 15, the acknowledged prior art of Figs. 1G and 1H disclose the circuit device being an integrated circuit.

Regarding claim 17, the acknowledged prior art of Figs. 1G and 1H disclose a semiconductor device, comprising:

- an electrode (at under the 3a) formed on a base surface;
- a bump (3a) formed on the electrode;
- a pad (4a);
- a connecting means (5), comprising a plurality of conductive particles (1), whereby conducting the bump and the pad with the conductive particles bonded between; and
- a barrier rib (6 and 6a) forming on the base surface, separating the conductive particles.

7. Claim 22 is rejected under 35 U.S.C. 102(b) as being anticipated by Loh et al.

Art Unit: 2815

Regarding claim 22, Loh et al. discloses in Fig. 5 a method for making a semiconductor device (10), comprising the steps of:

- providing a circuit device (12), wherein the circuit device is formed with plural electrodes (16) on one side thereof;
- forming a protective layer (20) on the side of the circuit device with the electrodes exposed;
- forming plural bumps (18) on the protective layer in accordance with the electrodes, and conducting the electrodes and the bumps; and
- forming plural barrier ribs (42) on the side of the circuit device, thereby separating the bumps.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 6 ~ 10, 13, 14, 16 and 18 ~ 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the acknowledged prior art of Figs. 1G and 1H in view of Loh et al.

Regarding claim 6, the acknowledged prior art of Figs. 1G and 1H disclose the claimed invention except for a third barrier rib. However, Loh et al. teaches in Fig. 7b and Fig. 9 the

barrier rib (42) being further comprised of a third barrier rib (at the top part of 42 which is connecting the three 42s) extending along a second direction, forming a partition between bumps (22) corresponding to first (any group of 22) and second pads (any group of 22). Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify the acknowledged prior art of Figs. 1G and 1H by using the third barrier rib as taught by Loh et al. The ordinary artisan would have been motivated to modify the acknowledged prior art of Figs. 1G and 1H in the manner described above for at least the purpose of minimizing the possibility of an electrical short circuit (column 2, lines 16 ~ 18).

Regarding claim 7, Loh et al. discloses in Fig. 9 the first and the third barrier ribs being connected, forming an L-shaped structure (at the point view of right side of 42 and the top of 42).

Regarding claim 8, Loh et al. discloses in Fig. 9 the first and the third barrier ribs being connected, forming a T-shaped structure (at the point view of middle side of 42 and the top of 42).

Regarding claim 9, Loh et al. discloses in Fig. 9 the second and the third barrier ribs are connected, whereby forming a L-shape structure.

Regarding claim 10, Loh et al. discloses in Fig. 9 the second and the third barrier ribs are connected, forming a T-shaped structure.

Regarding claim 13, the acknowledged prior art of Figs. 1G and 1H disclose the claimed invention except for a material of the bump. However, Loh et al. teaches in Fig. 4 and column 5, line 9 a bump (18) being made of Au. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify the acknowledged prior art of Figs.



1G and 1H by using the Au for the bump material as taught by Loh et al. The ordinary artisan would have been motivated to modify the acknowledged prior art of Figs. 1G and 1H in the manner described above for at least the purpose of increasing electrical connection.

Regarding claim 14, the acknowledged prior art of Figs. 1G and 1H disclose the claimed invention except for a material of the substrate. However, Loh et al. teaches in Fig. 4 and column 1, line 12 a substrate (14) being made by glass. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify the acknowledged prior art of Figs. 1G and 1H by using the glass for the substrate material as taught by Loh et al. The ordinary artisan would have been motivated to modify the acknowledged prior art of Figs. 1G and 1H in the manner described above for at least the purpose of reducing resistance.

Regarding claim 16, the acknowledged prior art of Figs. 1G and 1H disclose the claimed invention except for a type of the circuit device. However, Loh et al. teaches in Fig. 4 and column 5, lines 24 ~ 28 a circuit device (14) being a flexible printed circuit. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify the acknowledged prior art of Figs. 1G and 1H by using the flexible printed circuit for the circuit device as taught by Loh et al. The ordinary artisan would have been motivated to modify the acknowledged prior art of Figs. 1G and 1H in the manner described above for at least the purpose of decreasing a size of the semiconductor package.

Regarding claim 18, the acknowledged prior art of Figs. 1G and 1H disclose the barrier rib being made by an isolating material;

- the pad is further comprised of plural first pads (any group of 4a) and second pads (any group of 4a);

- the barrier rib is further comprised of a first barrier rib (any one of 6) extending along a first direction, separating the conductive particles between the first pads;
- the barrier rib is further comprised of a second barrier rib (any one of 6) extending along the first direction, separating the conductive particles between the second pads.

The acknowledged prior art of Figs. 1G and 1H does not disclose the barrier rib being further comprised of a third barrier rib extending along a second direction, separating the conductive particles between the first and the second pads. However, Loh et al. teaches in Fig. 7b and Fig. 9 the barrier rib (42) being further comprised of a third barrier rib (at the top part of 42 which is connecting the three 42s) extending along a second direction, forming a partition between bumps (22) corresponding to first (any group of 22) and second pads (any group of 22). Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify the acknowledged prior art of Figs. 1G and 1H by using the third barrier rib as taught by Loh et al. The ordinary artisan would have been motivated to modify the acknowledged prior art of Figs. 1G and 1H in the manner described above for at least the purpose of minimizing the possibility of an electrical short circuit (column 2, lines 16 ~ 18). Further, the limitation “wherein the first pads are input terminals of the LCD monitor, and the second pads are output terminals of the LCD monitor” is intended use language which does not differentiate the claimed apparatus over the acknowledged prior art of Figs. 1G and 1H.

Regarding claim 19, Loh et al. discloses in Fig. 9 the first and the second barrier rib being respectively connected to the third barrier rib, forming an L-shaped structure.

Regarding claim 20, Loh et al. discloses in Fig. 9 the first and the second barrier ribs being respectively connected to the third barrier rib, forming a T-shaped structure.

Art Unit: 2815

Regarding claim 21, the claimed invention except for a material of the bump. However, Loh et al. teaches in Fig. 4 and column 5, line 9 a bump (18) being made of Au. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify the acknowledged prior art of Figs. 1G and 1H by using the Au for the bump material as taught by Loh et al. The ordinary artisan would have been motivated to modify the acknowledged prior art of Figs. 1G and 1H in the manner described above for at least the purpose of increasing electrical connection.

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Merz et al. discloses a rib structure in the semiconductor package.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is (703) 305-6194. The examiner can normally be reached on M-F (10:30 - 7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 308-7722 for After Final communications.

Art Unit: 2815

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Chris C. Chu  
Examiner  
Art Unit 2815

c.c.  
July 14, 2003

A handwritten signature in black ink, appearing to read 'Eddie Lee', with a large, sweeping loop at the top and a stylized, cursive-like structure below.

**EDDIE LEE**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**